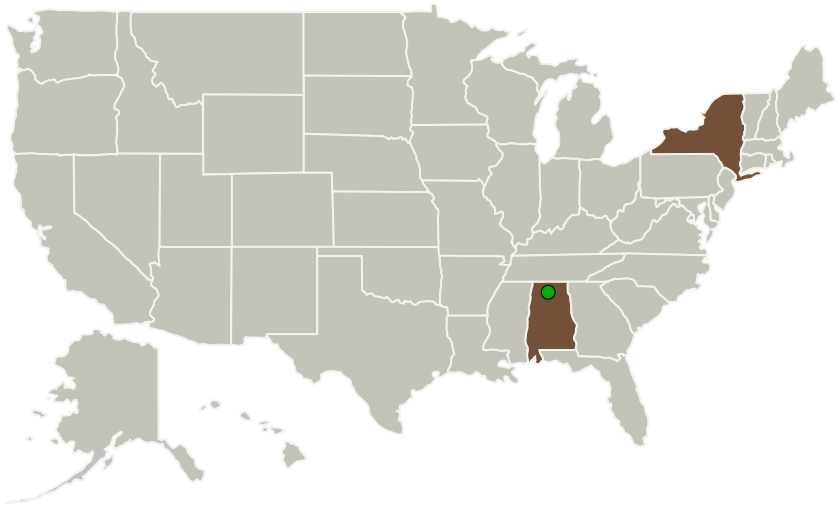
Rad Hard Imaging Array with Picosecond Timing, Phase I

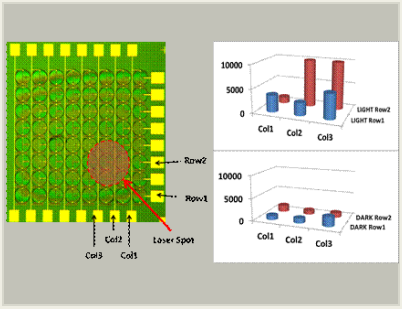
Completed Technology Project (2013 - 2013)

Project Introduction

For a wide range of remote sensing applications, there is a critical need to develop imaging arrays that simultaneously achieve high spatial resolution, high sensitivity, and sub-nanosecond timing resolution. Many of these remote sensing applications furthermore are satellite and space based, where the imaging array also needs to be rad hard; particularly for the harsh radiation environments typically found on certain deep space missions, such as to the moons of Jupiter. LightSpin Technologies is developing a high performance solid-state cross-strip anode imaging single photon avalanche diode (SPAD) array technology using rad hard GaAs SPAD arrays. This approach promises substantial improvements in spatial resolution (< 10 microns), timing resolution (< 100 psec), and count rate (> 10 Gcps). LightSpin has proven the concept provides excellent performance in small arrays (8 X 8 pixels) and developed a theoretical foundation enabling rapid scaling of the arrays to achieve Megapixel resolution at low cost.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
LightSpin Technologies, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Endicott, New York
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	New York

Project Transitions

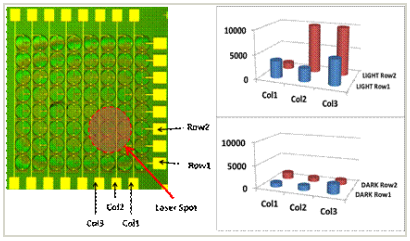
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138433)*

Images



Project Image
Rad Hard Imaging Array with Picosecond Timing
(https://techport.nasa.gov/image/125829)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
LightSpin Technologies, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

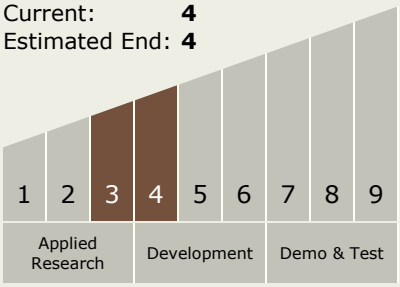
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Eric Harmon

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System